CYCLES AS PATTERNS

Inspired by *The Growing Story* / Ruth Krauss, illus. Helen Oxenbury

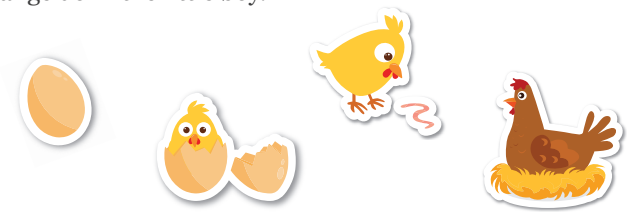
The Story

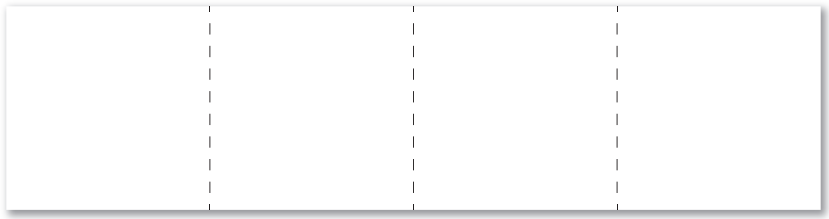
A little boy lives on a farm where everything around him is growing, making him wonder "Am I growing too?" His mother keeps reassuring him that he is growing, but the boy can't see how he is changing the way he can see changes happening in his puppy, the barnyard chicks, and all the plants and trees.

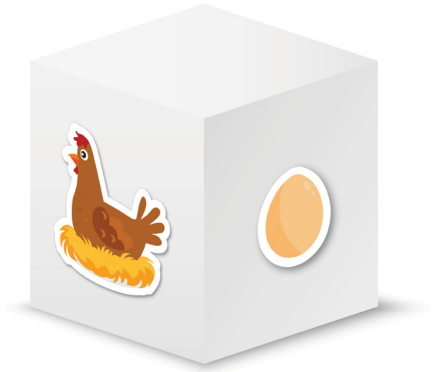
Consider the Math Concept

This story offers rich connections to the way the mathematical question "what comes next?" can be found in the growth and changes we see in plants and animals, including humans! It also explores how plants, animals, and humans grow and change differently. For example, while the tree, the puppy, and the boy all increase in size during the story, their rate of growth varies enormously. Physical growth in the puppy and seasonal changes in the tree progress much faster than growth and change do in the little boy.

Focusing on growing patterns is typically most appropriate for children who are in kindergarten and the early primary grades. Their ability to understand growth over time is developing rapidly as is their understanding of cause and effect. By kindergarten, many children can use the clearly marked stages of the life cycles of plants and living creatures to generalize the way an individual living thing grows to maturity in a predictable sequence. Talking about cycles is a natural way to develop children's understanding of ordinal words, including *first, second, third, next, after,* and *finally.*







PLAN

Materials

- Heavy cardstock or cardboard, such as from a tissue box or milk carton
- Scissors
- Tape
- Paper cut into 4"× 4" squares or similar
- Markers and crayons
- Glue

This activity works best going from whole group to small group settings. Start out by working with all the children to open the discussion and model the cycle box (described on page 46), but work with small groups as the children make and discuss their own cycle boxes.

On the paper squares, draw an arrow pointing to the left with the label *before* and another arrow pointing right with the label *after*. There should be plenty of space in the box for children to write a few words and draw a picture. Ahead of the activity, prepare four of these paper squares with pictures that show the life cycle stages of one of the creatures from the story. For example, if you choose to model the cycle box for a chicken, the four stages might be a drawing of an egg, one of a baby chick, one of a young chicken, and one of an adult chicken that can lay eggs. Hold off labeling the stages with words; you'll do that together with the children.

Explore and Investigate Together

Once the children are familiar with the story, ask them for their thoughts about why the book is called *The Growing Story*. They may first talk about how the boy grows, but be sure they also think about how the chicks, puppy, and pear tree also grow and change. Discuss how all living things follow the same pattern: they begin very small and then grow bigger until they reach adult size. The adult plant or animal can then produce eggs or seeds that will grow into a new generation. Explain that a pattern that goes around again and again, like these growing events or the four seasons, is called a *cycle*. Use the illustrations to show one cycle, such as the tree in different seasons or the puppy growing into a dog.

Begin by modeling how to create a cycle box with the whole group, doing the actual work of putting together the cycle box so the children

can watch but calling on them to give you help with the directions. Cut heavy cardstock into a long, thick strip, then fold the strip into four equal panels. Lay the strip flat again after creasing it and set it aside. Bring out the paper squares depicting the four stages of the life cycle of an animal from the book that you prepared ahead of the activity. Display the squares in a random order in a way that is visible to all of the children. Explain to the children what the before and after arrows on each square mean, then ask them to help you decide what to name each stage and in what order the life stages happen. Once the order of the life stages has been determined, have the children help you glue them on the cardstock strip you folded earlier, one in each of the four panels. Refold the cardstock strip and tape the ends of the first and last panels together to create a box that can stand.

Invite a few of the children to turn the box in their hands and to name each of the stages in the chicken's life cycle. As they do, emphasize the before and after sequence of the stages and how the rule for cycles is that the stages must occur in a predictable fixed order; a chick can only hatch after an adult chicken has laid an egg.

Work in small groups to have the children make their own cycle boxes for another creature or plant from the book. You might create a reference chart that shows terms for each stage. A flower, for example, could have *seed*, *sprout* (or *shoot*), *bud* (or *blossom*), and *flower*. Provide children with nonfiction books with realistic photographs and sketches of the plant or animal they are creating a cycle box for to reference as they draw their own pictures. Encourage them to look closely at these books to observe details they can use to help them draw as accurately as possible.

Talk About the Math

While children may be able to recite the different stages of growth for a specific plant or animal, the concept that each stage involves changes is abstract. Ask questions and start conversations to facilitate deeper thinking about the growth cycle, like the following:

- What does it mean to be a baby or a grown-up (adult)?
- What are some things you can do now that you couldn't do when you were a baby? What are some things you want to be able to do when you are bigger that you can't do now?
- Can you think of something you do each day that needs to happen in a specific order?

Individualize the Activity

- If identifying and ordering stages of growth into the correct pattern using a cycle box is challenging for some children, focus on how much they have developed themselves since they were born. Use sentence frames like these for children to complete: "When I was little, I couldn't _____. Now that I am older, I can _____." You might ask families to bring in photos of the children.
- If there are children in your class who speak a home language other than English, before introducing this activity, research the words in their home languages for the various plants, living creatures, and growth stages you will be exploring and using as labels. Families are a great resource to provide the vocabulary for children's home languages.
- Give children who excel at identifying and ordering the life cycle stages of plants and animals explored in the story the opportunity to choose a plant or animal they're interested in and create a cycle box with drawings and labels they come up with. An activity like this could be connected to a study about animal families or an inquiry about butterflies or another specific creature. Provide resources for children to research how long each stage lasts for different animals or plants. For example, robins grow from a hatched egg to an adult in about three weeks. Most dogs mature within a year, but each breed differs.

More Books

Goodbye Summer, Hello Autumn / Kenard Pak

Plant the Tiny Seed / Christie Matheson

Pumpkin Pumpkin / Jeanne Titherington